

Division: Mississippi Valley
District: Rock Island
Date: 06 September 2000

**ENVIRONMENTAL MANAGEMENT PROGRAM
DEFINITE PROJECT REPORT (DPR)
PLEASANT CREEK
HABITAT REHABILITATION AND ENHANCEMENT PROJECT (HREP)**

1. **Project:** Pleasant Creek Habitat Rehabilitation and Enhancement Project.
2. **Location:** The 2,350-acre Pleasant Creek Wildlife Area is located in Jackson County, Iowa, between Mississippi River Miles 548.7-552.8 on the Iowa side of the channel, and is about 4 miles south of Bellevue, Iowa (plate 1). All project lands are in Federal ownership.

3. **Project Description:**

3.1 Project Purpose: The purpose of the project is to enhance wetland and aquatic habitat. A series of spring and fall floods, coupled with higher pool levels, have deteriorated the wildlife value of this unit. Full realization of the potential habitat value in the Pleasant Creek Wildlife Area has been hindered by increased turbidity and sedimentation with concomitant loss of aquatic vegetation and deterioration of waterfowl, other migratory birds, and aquatic mammal habitat. The recommended project features for Pleasant Creek Wildlife Area are designed to meet the project's goals and objectives.

3.2 Project Proposal: Project goals involve the enhancement of wetland and aquatic habitat. The following objectives have been identified to meet these enhancement goals:

- Increase quality food and cover resources for migrating waterfowl, terrestrial birds, and mammals.
- Increase the rate of success of emergent and moist soil vegetation.

3.3 Project Features: Cost effectiveness and incremental analyses have been performed. The following project alternative, designated as A1W1T0, is recommended as a best buy plan (see plate 2):

3.3.1 Moist Soil Management Unit (MSMU): A moist soil management unit would provide additional feeding areas and still water for migratory birds and potential spawning and nursery areas for fish. This feature consists of the conversion of an existing 50-acre agriculture field and low-level dike to a moist soil management unit by constructing a **low-level closure dike** along an approximately 5,400-foot alignment. The top elevation of 594 was determined based on the flooding frequency. This elevation provides for a 36% chance (or 2.7-year event) of overtopping in any given year. Based on historic trends, it is estimated that there is less than a

5% chance of overtopping during the growing season. The dike would be constructed from borrow taken from within the field with side slopes of 7 (horizontal): 1 (vertical) and a 10-foot crest. A **stoplog structure** would be placed within the new dike to provide gravity drainage of the unit.

3.3.2 Well with Pump: A well with a submersible 7.5-hp electric pump would be installed to provide water to the MSMU during the fall when river levels are not expected to inundate the area. The pump is sized to perform and maintain the interior flooding gradually over a 2-month period. The well and pump will be located along the existing upstream levee near Station 65+00. The pump will be provided with a manual water valve for controlling the flow and maintaining water elevation within the refuge. The power and control panels will be installed on an elevated platform that will ensure integrity during Mississippi River flooding.

3.3.3 Electrical Service: Since there is no electrical service at the site, new electrical service will be installed to operate the well pump. The District has performed a cost analysis comparing underground and overhead distribution. Underground distribution of the service down the centerline of the existing access road is recommended. Additionally, underground distribution is preferred within the refuge to avoid bird strike losses associated with overhead distribution. A memorandum containing details of this recommendation is on file at the District Headquarters. The electric cooperative will extend a medium voltage, single-phase line from its nearest accessible location to the property boundary of the refuge, and a billing meter will be installed at this location near the property entrance gate. Real estate property boundary issues regarding clearance of the railroad's property line and easement documents for access of the utility cooperative will be the responsibility of the cooperative.

3.3.4 Shoreline Stabilization: Approximately 1,500 lineal feet of Mississippi River shoreline will be repaired through the placement of revetment and bedding stone along the existing low-level dike. It is anticipated that dredged material from a chronic upstream cut will be used to dress and reclaim the eroded slope. The dredged material will be placed on 2.5H:1V. Approximately 9,600 tons of 400-pound top size erosion protection stone will be placed as a 2.0-foot-thick layer with slopes no steeper than 2H:1V. Approximately 5,000 tons of bedding stone will be placed in a 9-inch-thick layer beneath this stone.

Since the MSMU borders this stretch of the shoreline, this feature is considered essential to protect the investment from flood damages. However, it has been identified that the area in question was originally protected with revetment as part of the navigation channel. Consequently, this feature will be paid for out of O&M funds with Rock Island District's Operation Division accomplishing the work.

3.3.5 Trash Rack: A trash rack will be constructed to prevent debris from entering outlet corrugated metal pipe (CMP) structures #2 and #5 along Harris Slough. It will be constructed from hot-rolled steel H piles. It is estimated that 9 piles on 18-inch centers will be needed. The piles will be placed in the slough on a 5-foot radius from the outlet of the CMPs. The piles will extend to an elevation of 594.7 feet, which is approximately 7 feet above normal water surface elevation. This feature would increase the potential for reliable feeding and resting areas for

migratory birds, increase the abundance and diversity of the aquatic habitat, and possibly increase the potential for spawning and nursery areas.

3.3.6 Water Control Plan: The evaluation of the existing water control structures along with the recommended new structures was performed. A preliminary water control plan was developed to maximize the potential of the area. This plan will be finalized during the Plans and Specifications phase for inclusion in the Operation and Maintenance Manual. Implementing the plan could increase the potential for reliable feeding and resting areas for migratory birds, increase the abundance and diversity of the aquatic habitat, and possibly increase the potential for spawning and nursery areas.

3.4 Project Outputs: With construction of the project, gains are anticipated in the population of shorebirds during the summer months, the number of duck use days, and in the number of waterfowl and muskrat young produced. It is assumed that there will be a quality improvement in the Habitat Suitability Index (HSI) with the construction of the project. A detailed Habitat Evaluation Procedure analysis was performed and is on file at the District Headquarters. It is estimated that the closure dike would produce approximately 40 acres of MSMU. Based on the estimate of affected acreage, the recommended plan would produce a net gain of 79 Average Annual Habitat Units (AAHUs). The following table provides a synopsis of the best buy plans as determined through incremental analysis:

Plan Code*	Total AAHU	Cost (\$)	Avg Cost (\$/AAHU)	Inc Cost (\$)	Inc Output (AAHU)	Inc Cost per Output
A0W0T0	90.1	0	0	0	90.1	0
A1W1T0	167.6	68,519	409	68,519	77.5	884.1
A2W1T0	168.6	73,350	435	4,831	1.1	4645.2
*See Section 3.8 for description of the codes.						

3.5 Benefit Importance: The Mississippi River Flyway supports an average of 36% of all ducks in the contiguous United States. Eighteen species of waterfowl migrate through the Pleasant Creek Wildlife Area each fall and spring. Historically, the Mississippi River Valley has been one of the most important migration areas for mallards in the United States. Migration during the fall and spring is an energy-demanding activity. Migrants need access to nutritious foods and rest at stopover areas to replenish reserves and satisfy the energetic costs of migration. As a result, waterfowl rely on diverse habitats at mid-migration latitudes to satisfy nutritional needs of various events during their annual cycle. Strategically located within the Mississippi River Flyway, this closed area and other sites in the immediate region are famous as traditional resting areas for waterfowl and shorebirds on both their spring and fall migrations to and from their breeding grounds in Canada and their wintering grounds in the Mississippi Delta, along coastal marshes, and Central and South America.

The area contains a high population of deer, an active bald eagle nest, a heron rookery, and a 40-acre stand of the northern-most strain of wild pecan trees. This area has long been known for its excellent fisheries.

3.6 LERRDs (Lands, Easements, Rights-of-Way, Relocations, and Disposals): The proposed project is located within the navigable waters of the Mississippi River on United States Government-owned lands. Additional lands, easements, and rights-of-way for the construction, operation, and maintenance of the project will need to be acquired for the installation of the electrical service. The Rock Island District is currently working with the electric cooperative to obtain the necessary utility easements. The project will be implemented on Government fee-owned land that is included in the cooperative agreement between the United States Army Corps of Engineers and Department of Interior, U.S. Fish and Wildlife Service (USFWS) with the exception of utility easements necessary for the electric service.

No Public Law 91-646 relocation assistance payments are required for this project. There will be no relocations of facilities or utilities in connection with this project. All environmental clearances will be completed prior to construction. There will be no induced flooding caused by the construction of this project. No additional real estate interests are required; however, prior to project implementation, the model Memorandum of Agreement will be executed.

3.7 Relationship to Other Projects: In 1995, the USFWS accomplished site upgrades of this project to improve water management capability. This included the construction of two spillways, upgrading of the existing low-level perimeter dike/maintenance road, and the removal and replacement of several water control structures. These features were part of the original scope of the HREP.

Recognition of changes occurring in habitat composition and subsequent declines in migratory bird, wildlife, and fisheries habitat quality and availability along the Mississippi River prompted the proposal of several projects by Federal and State agencies responsible for natural resource management in the Pool 12/13 area. The Potter's Marsh HREP, located downstream at RM 522.5-526.0, has been completed. The Spring Lake HREP, located downstream at RM 532.0-536.0, has been completed. The Brown's Lake HREP, located downstream RM 544.0-546.0, also has been completed.

3.8 Evaluated Features and Alternatives: The following features and options were evaluated for cost effectiveness, constructability, and operability (see plate 3):

3.8.1 Moist Soil Management Unit (MSMU) Creation: Options included different combinations and dimensions of the MSMU.

3.8.1.1 Dike Alignment: Four dike alignments were originally proposed. Two of the alignments would significantly impact bottomland hardwood forest. The recommended alignment will create approximately 40 acres of MSMU. This option was designated by the letter "A" in the habitat evaluation.

3.8.1.2 Dike Side Slopes and Height: Various dike side slopes were evaluated. It was determined that 7:1 slopes would allow for maintenance while discouraging rodent activity. It was imperative that a low-level dike height be maintained to minimize flooding damages by reduction of head between the river and the interior of the MSMU.

3.8.1.3 Water Source Options: One other water source option was evaluated besides the well. Gravity flow from the Mississippi River was considered. The MSMU would be inundated when the existing Mississippi River dike is overtopped (approximately 5% of the time during the growing season) or through gravity filling via the water control structure and would remain inundated until water levels drop naturally. This option is not desirable to the sponsor due to the sedimentation that would result. Also, historic fall river levels show that there frequently would not be sufficient water levels to allow for seasonal inundation of the MSMU. This feature was designated by the letter “W” in the habitat evaluation.

3.8.2 Mast Tree Planting: This feature would consist of planting mast-producing tree species in the 7-acre portion of the southern end of the existing agriculture field. The tree planting area is not included in the MSMU as the dike would not encompass it. This feature was designated by the letter “T” in the habitat evaluation.

3.8.3 Third Spillway: The option of the construction of a third spillway, located along Harris Slough, was considered. It was determined through hydraulic modeling that the existing spillways should provide the level of control that the sponsor needs if: (1) debris was prevented from clogging the existing structures #2 and #5, and (2) the water control plan is implemented. In addition, the construction of this spillway may result in less control of the upper lakes’ water levels unless the spillway is constructed with a control structure. This feature was not included in the habitat evaluation.

3.8.4 Trash Rack: The option of the use of wooden posts in the construction of the trash rack along Harris slough was considered as an alternative to the steel posts that are recommended. Wooden posts must be treated with creosote, which poses an environmental hazard. Additionally, wooden posts would deteriorate quicker than steel. This feature was not included in the habitat evaluation.

3.9 Methodologies: In order to plan and design, the project team utilized standard engineering and biological methods to determine the necessary level of analysis. These methodologies included, but were not limited to, obtaining survey data, sub-surface information, hydraulic modeling, and slope stability analysis. Full documentation of these analyses can be found on file at the Rock Island District.

- The FEMWATER module of the Department of Defense Groundwater Modeling System Version 2.1 (GMS) was used to estimate well drawdown.
- Wildlife Habitat Appraisal Guide (WHAG) models were used to determine fish and wildlife habitat benefits within the project. Models were used to analyze project outputs,

and IWR (Institute for Water Resources) Plan software was used as the incremental analysis tool.

- A formal construction cost estimate was performed using the MCACES (Micro Computer Aided Cost Engineering System) software. The entire analysis is on file in the Rock Island District.
- A cultural resources survey was performed to assess the historical significance of the area. This survey was coordinated with the appropriate interested parties, Native American tribes, and the State Historical Society in compliance with the National Historic Properties Act of 1966, as amended in 1999, and its implementing regulations 36 CFR Part 900, "Protection of Historic Properties."
- A Hazardous, Toxic, and Radioactive Waste (HTRW) compliance assessment was conducted. The assessment is included as an appendix to the Environmental Assessment.

4. Views of Sponsor: The USFWS is the Federal project sponsor and should ensure that all proposed enhancement features are compatible with national refuge objectives and management strategies. Operation and maintenance of the project is the responsibility of the USFWS in accordance with Section 107(b) of the Water Resources Development Act of 1992, Public Law 102-580. These functions will be further specified in the Project Operation and Maintenance Manual to be provided by the U.S. Army Corps of Engineers prior to final acceptance of the project by the sponsor. The Iowa DNR is the non-Federal project partner.

5. Views of Federal, State, and Regional Agencies: The USFWS has produced a Coordination Act Report (CAR) for this project. The emphasis on wetland and waterfowl management at Pleasant Creek reflects the immediate goals of local resource managers.

6. Environmental Compliance Requirements: National Environmental Policy Act (NEPA) compliance and documentation are addressed in the Draft Environmental Assessment (EA). The EA will be finalized during the preparation of Plans and Specifications. Federal and State permits including water quality certification will be completed in conjunction with the NEPA documentation.

7. Costs and Benefits:

7.1 Costs:

Estimated Federal EMP Cost	\$ 729,320
Estimated Federal O&M Cost	\$ 674,455
Total Estimated Project Cost	\$1,403,775

7.2 Implementation of this project will provide benefits locally to the Pleasant Creek Wildlife Area. Cumulative benefits will be provided to Mississippi River Pool 13. These benefits will be in the form of improved wetland and aquatic habitat.

Annual inspection, monitoring, and maintenance will cost approximately \$5,400 each year. It will include inspection and mowing of the dike, maintenance and operation of the well pump, and operation of, and debris removal from, the water control structure and trash rack.

8. Schedule:

Action	Date	FY
Division Office approval of DPR	Oct 00	2000
Public Review of Environmental Assessment	Oct 00	2001
Completion of Plans and Specs	Dec 00	2001
Division Commander Sign PCA/Construction Work Allowance Request	Dec 00	2001
Contract Award	Apr 01	2001
Construction Start	May 01	2001
Complete Construction	Nov 01	2001

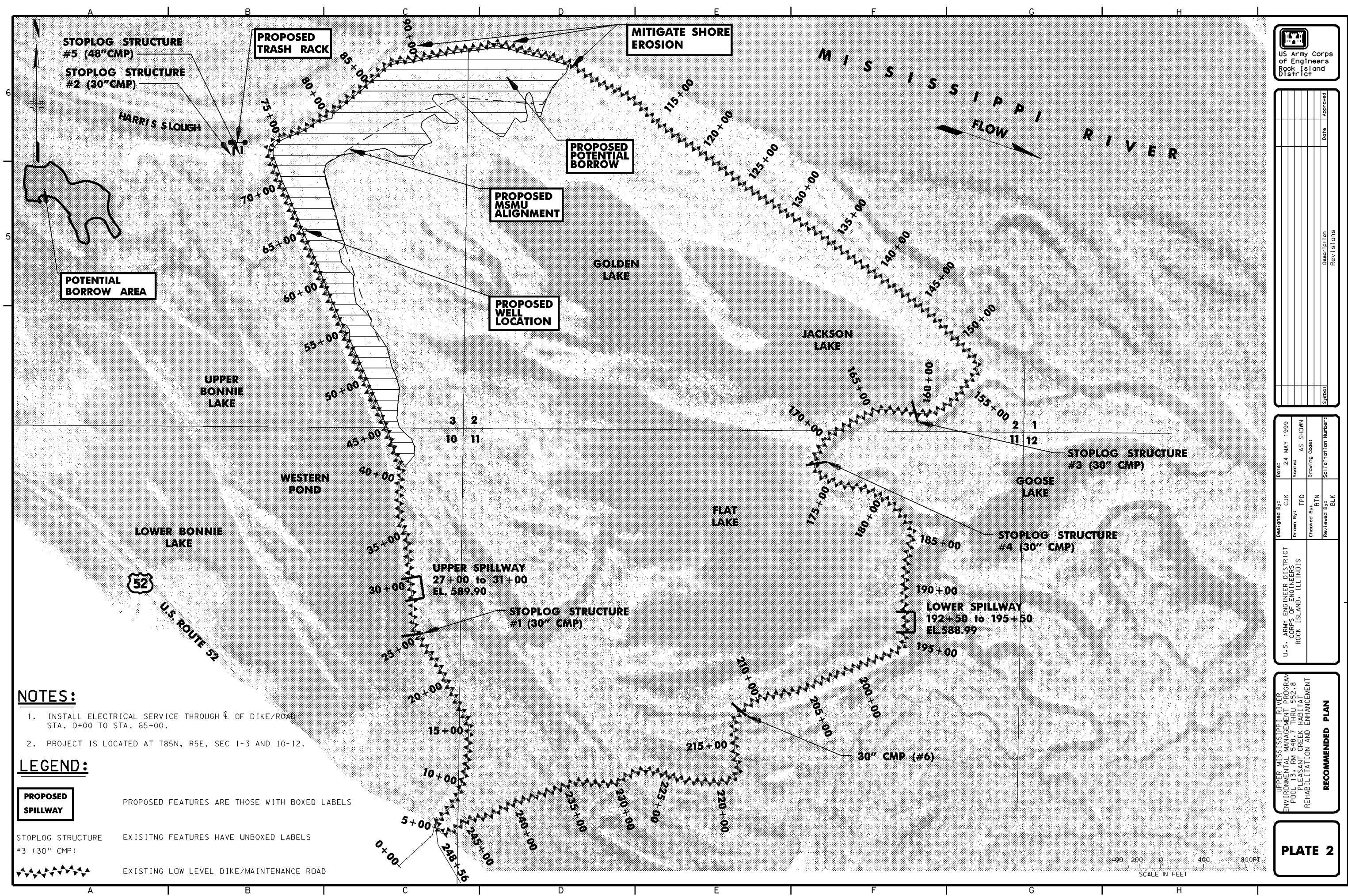
9. Supplemental Information: None

10. Financial Data:

Project Costs (\$ thousands)					
		Funding Needs			
	Total	FY98	FY99	FY00	FY01
Feasibility	211		151	60	
Combined Env. Comp. Plans & Specs	75				75
Construction	1118				1118
Totals	1404		151	60	1404

11. Federal Allocations to Date: This item will be completed on fact sheets accompanying funding requests.

Combined Env. Comp. Plans & Specs:
Construction:

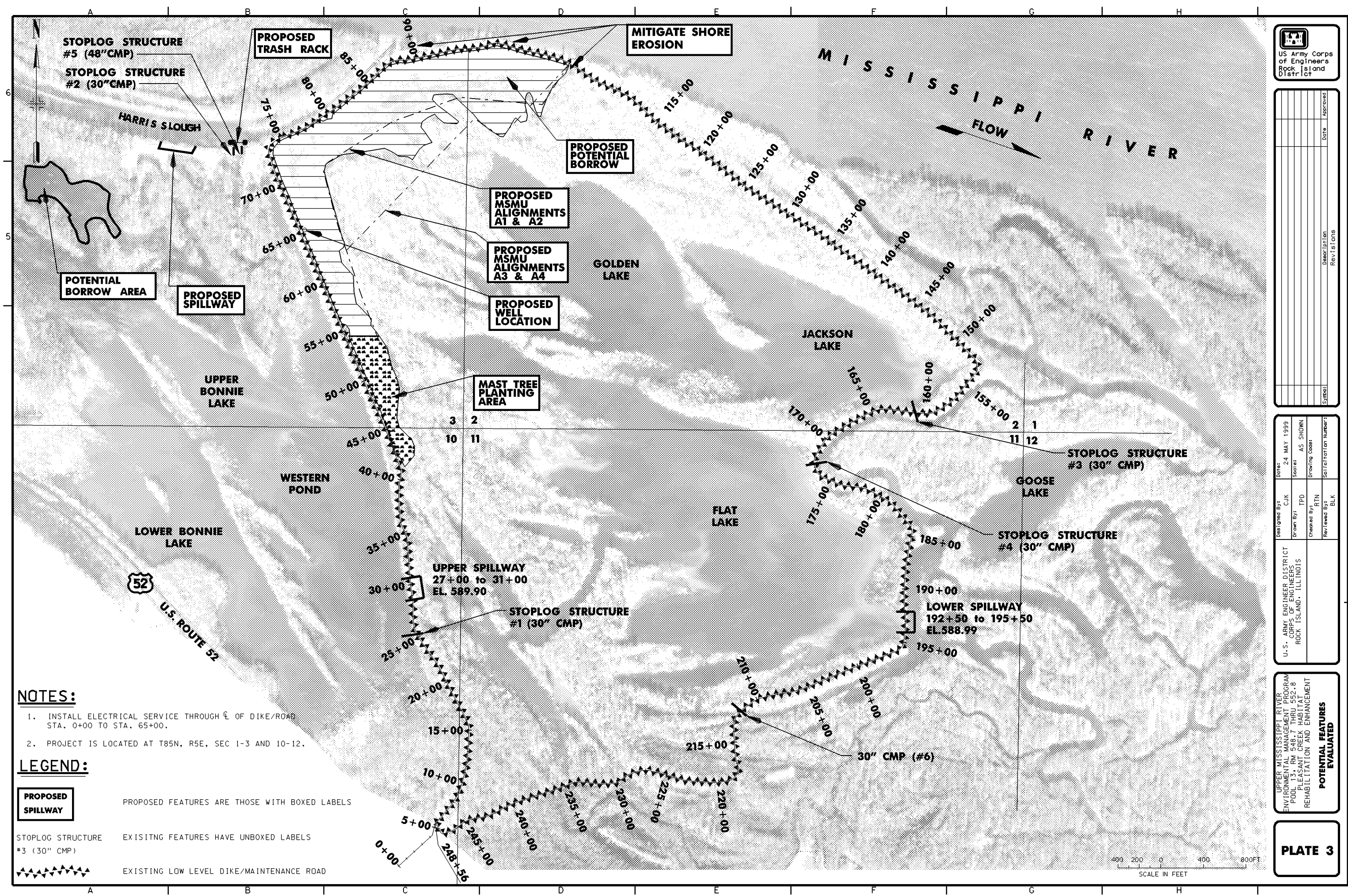
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RECOMMENDED PLAN

PLATE 2

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U.S. ARMY ENGINEER DISTRICT CORPS OF ENGINEERS ROCK ISLAND, ILLINOIS	Designed By: CUK	Dated: 24 MAY 1999
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**POTENTIAL FEATURES
EVALUATED**

PLATE 3

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